RESPONSE TO FCC-02-380

Specifically, Page 19, Section B, Paragraph 17 - UNLICENSED SPECTRUM

As a Wireless InterNet Service Provider (WISP) operating under the guidelines as set forth for Part 15 Unlicensed Operation, this section is of particular interest to us.

Virtual Networking Services, Inc. is an Internet Service Provider using 900MHz, 2.4GHz and 5.2/5.8GHz equipment to provide broadband Internet service to areas that are otherwise not served by cable or DSL Internet providers. The areas we serve include parts of King, Pierce and Snohomish Counties in the State of Washington.

Since this area IS known as "The Evergreen State", it becomes painfully obvious that the 36dBm power limitations make for a number of engineering challenges:

1. The foliage and line of sight characteristics of all three bands referenced above require that either transmitters be located at high elevations—not practical because of local zoning restrictions—or high densities of base stations be installed.
2. Lack of protection from other unlicensed transmitters (i.e., the home wireless network products) requires that we over design each home installation to assure the neighbor's network will not cause significant interference—thus increasing the costs to deploy to said rural subscriber.
3. Lack of any form of frequency coordination makes these networks vulnerable to high-power high-bandwidth point-to-point systems such as the Tsunami equipment deployed in the 2.4 and 5.8 GHz bands by the cellular carriers for T-1 backhaul. Since these bands are unlicensed and unprotected, there is no recourse if a carrier elects to install such a link over the top of your existing system.

In our opinion, the ideal solution would be deployment of the 3650-3700 MHz band proposed in 02-381 for LICENSED point-to-point links to connect and backhaul base station locations, and LICENSED point-to-multipoint operation in a band below 900 MHz, with a maximum of 5 watts transmitter output and 50 watts EIRP at the antenna to an omnidirectional radiator at the base station, and a maximum

of 5 watts transmitter output and a 3dB beamwidth of less than 60 degrees at the subscriber location.

Either OFDM or FHSS techniques should be deployed, with an aggregate actual throughput bandwidth at the base station of NO LESS THAN 10MBPS. As loading density increases, it would be incumbent on the WISP to employ sectorized base station antenna techniques, and sufficient bandwidth/channels should be provided to expand to six 60 degree sectors and associated transmitters. Good engineering would dictate that the WISP would reuse these six channels on overlapping cells in a manner similar to the frequency reuse on an AMPS cellular telephone system.

Automatic Power Control (APC) would be employed to insure that only the needed power was transmitted by the base station(s) and subscriber radio(s).

It is envisioned that said licensed WISP network would be deployed as follows:

1. Initially, omnidirectional base stations would be installed on high spots every 8-15 miles, dependant on terrain, operating on say—an assignment in the 650-750 MHz band.

2. 3650-3700 MHz point-to-point links would connect the base station sites together in a redundant configuration, using BGP, Sonet, OSPF or some other technology for redundant routing in the event of a catastrophic site failure such as a lightning strike.

3. At some redundant point in the point-to-point network, bandwidth would be provided from one or more of the Tier 1 Internet Providers of sufficient capacity to provide the entire base station network with broadband speeds. Typically—this would be on the order of 256K - 1.5MB and the bandwidth would be increased from the Tier 1 Provider as required to maintain sufficient performance.

4. As subscriber density increased, individual base stations would be converted from the omnidirectional model to sectorized systems as outlined previously.

5. As base station to base station links approach capacity, additional multiples of point-to-point links would be installed.

LICENSING

It is our belief that WISPs should be required to coordinate operations through a recognized Frequency Coordinator, and licensed much the same as Land Mobile Radio Community Repeater Operators were coordinated and licensed over the years.

They would be required to submit an application showing the areas of intended operation, as well as accurate propagation plots generated by recognized Terrain Analysis Programs with accurate USGS mapping data, such as those made by RadioSoft and others for this specific application.

Furthermore, it would be incumbent on the WISP operator to insure that operation of said system causes no harmful interference to other WISPs in adjacent areas. The Frequency Coordinator could act as the arbiter in those cases where the individual WISPs are unable to resolve said issues.

Lastly, with the implementation of licensing, some form of engineering certification should be required, much the same as formerly a General Radiotelephone License was required to service Land Mobile Equipment. Perhaps something like the Technician Certification Programs that replaced it. The use of skilled technicians and engineers to design and install these systems will go far in insuring that the rural customers are well served and interference and technical issues to not act to prevent providing said service.

IN CONCLUSION

Wireless Broadband Internet, as provided by WISPs operating under the auspices of Part 15 are one of the fastest growing providers of broadband access to under-served areas, yet are probably the least known. Since we do not have the billions of dollars available to bid on MMDS and other licensed frequencies, we are “under the radar” of the FCC—at least until recently. While we are strong proponents of licensed, coordinated operation—we are bitterly opposed to the “spectrum auctions”. This service

should be provided by the operators who are best positioned to provide it in low-density markets—the Wireless Internet Service Provider. The cash return in these low density markets is such that it is not viable for a large regional or national carrier to roll out infrastructure. This is something that WISPs know how to do and do it cost effectively.

Thank you for allowing us this opportunity to express our opinions.

Sincerely,

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